

**ORIGINAL**



**RECEIVED**

2006 JUN 16 P 1:58

AZ CORP COMMISSION  
DOCUMENT CONTROL

**Picacho Water Company**

**9532 E. Riggs Road**

**Sun Lakes, AZ 85248**

June 8, 2006

Docket Control  
Arizona Corporation Commission  
1200 West Washington  
Phoenix, AZ 85007

Re; Picacho Water Company (PWC) – Application for Extension of Certificate of Convenience and Necessity (CC&N) Docket No W-03528A-06-0313  
Insufficiency Letter

The following is PWC's response to the attached June 1, 2006 Insufficiency letter from the Commission:

1. Failure to comply with prior Commission Decisions –

Regarding Decision No. 65133 in Docket No. W-03528A-01-0169, PWC has not executed any documents related to any financing matters authorized in Decision No. 65133, and regarding Decision No. 67670 in Docket No. W-03528A-04-0641, there are no customers yet in the proposed service area. PWC is not out of compliance with either Commission decision.

2. If the application to extend the CC&N is approved PWC will file an application with the Commission seeking authority for either debt financing, equity financing, or a combination of debt and equity financing to fund the cost of constructing the water facilities to serve the extension area.

3. PWC is not a designated provider, nor is there a physical availability determination for the property. The developer of the proposed extension area has not yet been issued a certificate of assured water supply (CAWS), however, an application has been submitted for a CAWS in the proposed extension area. In connection therewith, a hydrology study was prepared which demonstrates that there is sufficient water available to meet the water demands of the proposed development for at least 100 years. The relevant pages of that study are attached. It is significant to note that the developer met with ADWR regarding this study and the methodology used has been approved by ADWR.

4. The application for a water franchise from Pinal County was submitted on April 3, 2006. The application is currently pending approval from the Board of Supervisors.
5. An application for a approval to construct from ADEQ has not yet been prepared.
6. PWC serves groundwater to irrigate a golf course in its existing CC&N area in accordance with state law.
7. There are no artificial lakes, golf courses, ornamental structures or other aesthetic water features planned for the extension areas. Open spaces in the proposed extension area will be watered with groundwater in accordance with state law.
8. An affiliate of PWC, Picacho Sewer Company (PSC), will commence delivering effluent to the golf course in the existing CC&N area as soon as it is available, which is expected to be in fall of 2006 when the development reaches 100 homes. Effluent piping for this effluent delivery is already in place. All excess effluent beyond what is reused will be recharged via PSC's recharge facilities pursuant to its aquifer protection permit and its constructed underground storage facility permit.
9. See attached.

An original and 13 copies submitted.

Sincerely,



Jim Poulos

**COMMISSIONERS**  
JEFF HATCH-MILLER- Chairman  
WILLIAM MUNDELL  
MARC SPITZER  
MIKE GLEASON  
KRISTIN K. MAYES



BRIAN C. MCNEIL  
Executive Secretary  
**RECEIVED**

**ARIZONA CORPORATION COMMISSION**

2006 JUN -1 P 3:49

AZ CORP COMMISSION  
DOCUMENT CONTROL

June 1, 2006

Mr. Jim Poulos  
9532 E. Riggs Road  
Sun Lakes, Arizona 85248

RE: Picacho Water Company – Application for Extension of Certificate of Convenience and Necessity (CC&N) Docket No. W-03528A-06-0313  
INSUFFICIENCY LETTER

Dear Sir:

In reference to the above mentioned application filed on May 4, 2006, this letter is to inform you that the application has not met the sufficiency requirements as outlined in the Arizona Administrative Code. The deficiencies are:

1. Failure to comply with prior Commission Decisions. According to Utilities Division's Compliance Database, the Company is not in compliance with Commission Decision Nos. 65133 and 67670, issued in W-03528A-01-0169 and W-03528A-04-0641, respectively. Attached is a list of the Compliance Delinquencies. Please contact Kim Battista at 602-542-0747 to resolve the Compliance Delinquencies.
2. According to the application, debit and/or equity will be used to finance the utility facilities need to serve the proposed extension area. Please explain.
3. Please provide a copy of the Arizona Department of Water Resources ("ADWR") Designation of Assured Water Supply or Certificate of Assured Water Supply for the CC&N area requested. If none of these are available, please provide a copy the ADWR's Physical Availability Determination. If a determination of Assured Water Supply has not been obtained from ADWR, please inform Utilities Division Staff ("Staff") of the status of the application for that determination.
4. Please provide a copy of the franchise agreement that includes the proposed extension area. If the proposed extension area is outside the corporate city/town limits, please provide a copy of the County franchise agreement that includes the proposed extension area. If the franchise agreement(s) has not been issued, please inform Staff of the status of the application for the franchise agreement.
5. Please provide a copy of the Arizona Department of Environmental Quality's Approval to Construct the water facilities to serve the proposed extension area. If the Approval to Construct has not been issued, please inform Staff of the status of the application for the Approval to Construct.

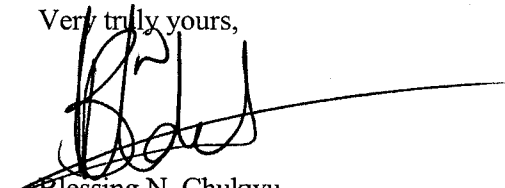
6. According to the application, "the Company currently provides water service to a golf course." Is groundwater being used to irrigate that golf course? Please explain.
7. Will any artificial lakes, golf courses, ornamental structures, open spaces, and any other aesthetic water features be built in the requested area? If so, does Picacho plan to use groundwater at the beginning of the project for artificial lakes, golf courses, ornamental structures, open spaces, and any other aesthetic water features, and if so, for how long? Please explain in detail.
8. At what point in time does Picacho intend to utilize effluent for artificial lakes, golf courses, ornamental structures, open spaces, and any other aesthetic water features? Please explain in detail. Please be sure to include the number of houses that would have to be built in order to generate enough effluent for such uses.
9. Please provide a copy of the Company's ADEQ Status Report.

Staff would like to use this opportunity to bring the following to your attention:

- Pursuant to the Arizona Administrative Code ("A.A.C.") R-14-2-411(C) for water and R-14-2-610(C) for wastewater, upon meeting sufficiency requirements, the Commission has 150 calendar days for its substantive review. This includes conducting a hearing and preparing Opinion and Order to present to the Commission at an Open Meeting; and
- Pursuant to A.A.C. R14-2-411(C)(3) and R-14-2-610(C)(3), Staff may terminate an application if the applicant does not remedy all deficiencies within 60 calendar days of the notice of deficiency.

If you have any questions concerning this matter, please do not hesitate to contact me at 602-542-0840 and Marlin Scott, Jr. at 602-542-7272.

Very truly yours,



Blessing N. Chukwu  
Executive Consultant III

BNC

cc: Docket Control  
Del Smith  
Lyn Farmer  
Brian Bozzo  
Vicki Wallace

## **COMPLIANCE DELINQUENCIES**

**UTILITY:** Picacho Water Company

**DOCKET:** W-03528A-01-0169

**DECISION NO:** 65133

**ACTION:** File copies of all executed financing documents setting forth the terms of the financing within 30 days of such financing. WATER SERVICE

**COMPLIANCE DUE DATE:**

**Compliance Past Due**

**UTILITY:** Picacho Water Company

**DOCKET:** W-03528A-04-0641

**DECISION NO:** 67670

**ACTION:** The Company shall notify the Compliance Manager of the Commission's Utilities Division 30 days prior to initiating service to customers in the proposed service area. The application of Picacho Water Company to extend the service territory under its existing Certificate of Convenience and Necessity to include the areas, as described in the Decision is hereby granted, conditioned upon its timely compliance with the conditions, and that this Decision be considered null and void without further Order if the Company fails to meet the conditions within the time specified. In the event either Picacho Water Company or Picacho Sewer Company requests an extension of time to make any of the compliance filings ordered herein, the Commission's Utilities Division Staff will docket a formal response to such request within thirty (30) days of the request.

**COMPLIANCE DUE DATE:**

**Compliance Past Due**

## **HYDROGEOLOGY INVESTIGATION**

### **Robson Ranch Units 27 & 28 Pinal County, Arizona**

Prepared for:

**Robson Communities**  
9532 East Riggs Road  
Sun Lakes, Arizona 85248

Prepared by:

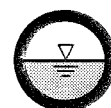
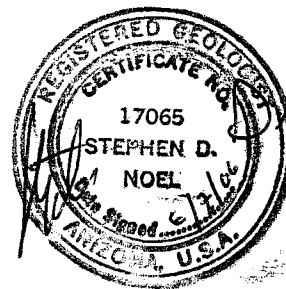
**Southwest Ground-water Consultants, Inc.**  
3033 North 44<sup>th</sup> Street  
Suite 120  
Phoenix, AZ 85018

June 7, 2006



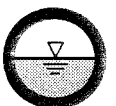
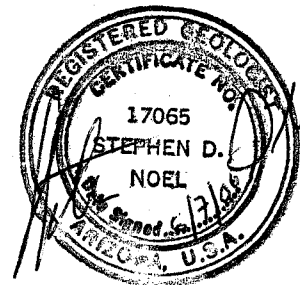
# TABLE OF CONTENTS

	<u>Page No.</u>
<b>TABLE OF CONTENTS</b>	i
<b>LIST OF FIGURES</b>	iii
<b>LIST OF TABLES</b>	iv
<b>LIST OF APPENDICES</b>	v
<b>1.0 INTRODUCTION</b>	1
<b>2.0 WATER DEMAND</b>	2
2.1 Land Use	2
2.2 Demand	2
2.2.1 Residential	2
2.2.2 Non-residential	3
2.2.2.1 Common Areas	3
2.2.2.2 Rights-of-way	3
2.2.2.3 Commercial	3
2.2.2.4 Construction	3
2.2.2.5 System Losses	4
2.2.3 Total Demand	4
<b>3.0 WATER SUPPLY</b>	5
3.1 Geology	5
3.2 Hydrogeology	7
3.2.1 Aquifer Parameters	7
3.2.2 Ground-water Surface	8
3.2.3 Historical Ground-water Levels	9
3.2.4 Ground-water Quality	9
<b>4.0 IMPACT OF PROPOSED DEMAND ON SUPPLY</b>	11
4.1 Aquifer Impact Analysis	11
4.1.1 Calculation Grid	11
4.1.2 Aquifer Parameters	11
4.1.3 Pumping Wells	12
4.1.3.1 Onsite Wells	12
4.1.3.2 Other Projects in the Study Area	12
4.1.4 Impact Simulation Output	14
4.2 100-year Ground-water Level	14



## TABLE OF CONTENTS (CONTINUED)

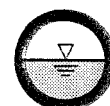
	<u>Page No.</u>
4.3 Conclusion	15
5.0 REFERENCES	16
FIGURES	18
TABLES	25
APPENDICES	28





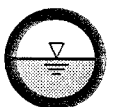
## LIST OF FIGURES

<u>FIGURE NO.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Well Location Map	19
2	Depth to Bedrock Map	20
3	2003-04 Ground-water Surface Map	21
4	Ground-water Hydrographs	22
5	Ground-water Quality Data Map	23
6	100-year Aquifer Impact Analysis Map	24



## LIST OF TABLES

<u>TABLE NO.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Water Demand Calculations	26
2	Pinal AMA Model Aquifer Coefficients	27



## LIST OF APPENDICES

<u>APPENDIX NO.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
A	Report of Well Driller – Log of Well	A-1
B	Aquifer Characteristic Data	B-1
C	Ground-Water Level Data	C-1
D	Ground-Water Quality Data	D-1
E	Impact of Surrounding Ground-water Users	E-1
F	THWELLS Aquifer Impact Analysis Output	F-1

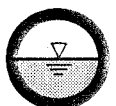


## 1.0 INTRODUCTION

The following report has been prepared by Southwest Ground-water Consultants, Inc. (SGC) in order to evaluate the water resources available to Robson Ranch Units 27 & 28 (Project) and to establish if these resources could satisfy the estimated projected demand of the proposed development.

The Project is located in Pinal County, Arizona, in the Eloy Sub-basin of the Pinal Active Management Area (AMA). The legal description is portions of Sections 20 and 21 of Township 7 South, Range 7 East, of the Gila and Salt River Base and Meridian. A location map is presented as Figure 1.

This report has been organized into five sections. Section 2.0 consists of a discussion of the Project's projected water demand. The ground-water resources available to the Project are presented in Section 3.0. The impact of ground-water development on the underlying aquifer is presented in Section 4.0. References cited throughout this report are listed in Section 5.0.



## 2.0 WATER DEMAND

### 2.1 LAND USE

The estimated land use plan for the Project consists of 175 acres that have been divided according to the following land use categories:

Use	Approximate Acreage	Approximate # of Units
Single Family Residential		583
Commercial	5.8	
Open Space	26	

The preliminary development plan includes a total of 583 single-family detached dwelling units (du). Based on an estimated occupant density of 2.1 capita per single family du, the total population is projected to be 1,224 people.

### 2.2 DEMAND

The water demand calculations presented below were estimated based on Arizona Department of Water Resources (ADWR) Pinal AMA Third Management Plan water requirements (ADWR, 1999). A tabulation of the water demand calculations is presented in Table 1.

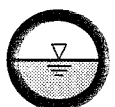
#### 2.2.1 Residential

The estimated residential demand for the Project is 163.3 acre-feet per year (ac-ft/yr). This demand is based on the following assumptions and unit rates.

- Interior and Exterior water use is 125 gallons per capita per day (gpc/d) (ADWR Office of Assured and Adequate Water Supply).
- Total number of single-family dwelling units is 583.
- Per capita occupancy rate is 2.0 capita per single-family housing unit (B&R Engineering, 2006).

Therefore:

- The average dwelling unit demand is 250 gpd/du.
- The total residential (indoor and outdoor) demand is 163.3 ac-ft/yr.



### **2.2.2 Non-residential**

The estimated non-residential demand for the Project is 117.8 ac-ft/yr. This total is the sum of the demands for landscaping common areas and rights-of-way, and commercial uses, as outlined below.

#### **2.2.2.1 Common Areas**

The demand estimate for common areas is based on a rate of 4.8 ac-ft/ac/yr for turf acres, and a rate of 1.5 ac-ft/ac/yr for low water use landscaping (lwul) acres. B&R Engineering (2006) indicated that within the common areas, 10.2 acres are proposed for turf, 28.07 acres are proposed for lwul, and 12.76 are proposed not to be landscaped. Accordingly, the estimated demand for parks and open space is estimated to be 91.1 ac-ft/yr.

#### **2.2.2.2 Rights-of-way**

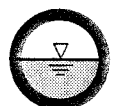
The demand estimate for the rights-of-way is based on a rate of 4.8 ac-ft/ac/yr for turf acres, and a rate of 1.5 ac-ft/ac/yr for lwul acres. B&R Engineering (2006) indicated that within the right-of-way, 1.48 acres are proposed for turf, 4.43 acres are proposed for lwul, and 28.36 acres are proposed not to be landscaped. Accordingly, the estimated demand for parks and open space is estimated to be 13.7 ac-ft/yr.

#### **2.2.2.3 Commercial**

A water use rate of 2.25 ac-ft/ac was applied to the 6 acres designated as commercial. This yields a total demand of 13.0 ac-ft/yr.

#### **2.2.2.4 Construction**

The total construction demand of 0.2 ac-ft/yr was calculated by estimating the water required for construction of homes. A rate of 10,000 gallons per housing unit was multiplied by 583 housing units, for a total construction water demand of 18 acre-feet. Since this is a one-time use, this value is divided by 100, for a yearly demand of 0.2 ac-ft/yr.

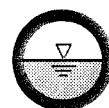


#### **2.2.2.5 System Losses**

Yearly system losses were estimated at 10% of the total of all other water demand components. Combining demand components yields a subtotal of 281 ac-ft/yr. Therefore, system losses are estimated at 28.1 ac-ft/yr.

#### **2.2.3 Total Demand**

Estimated total demand for the Project at full build-out, based on the proposed land uses and ADWR requirements, is 309.4 ac-ft/yr (191.8 gpm annual average).



### 3.0 WATER SUPPLY

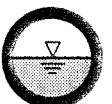
The water supply available to the Project consists of ground water from the underlying regional aquifer. Water for the Project will be served by Picacho Water Company from its existing service area. The planned well field for the service area includes wells located approximately two to four miles north of the Project. The discussion of local geology and hydrogeology presented below concentrates on the area within approximately 1 mile of the proposed well field, hereinafter referred to as the study area (Figure 1).

The geology and hydrogeology of the study area and region have been investigated by various individuals and agencies including, but not limited to, the Arizona Department of Water Resources (ADWR), (Wickham and Corkhill, 1989; Corkhill and Hill, 1990; Hammett, 1992; Corkhill and Plato, 1992), the Bureau of Reclamation (1977), and Oppenheimer and Sumner (1980). These investigators have discussed interpretations of depth to bedrock, and the lithology, thickness, and characteristics of the overlying alluvial units. Data were also obtained from the ADWR Basic Data Section, which maintains Well Driller's Reports, ground-water survey data, ground-water quality data, and well registries. Registered wells in the study area have been plotted on Figure 1, and Well Driller Reports for those wells are referenced in Appendix A.

#### 3.1 GEOLOGY

Current interpretations of the depth to bedrock in the study area indicate that it ranges from less than 800 feet below land surface (bls) near the Toltec Buttes to over 2,000 feet bls in the east (Oppenheimer and Sumner, 1980). Review of well driller reports in the study area (Appendix A) indicates that wells have been drilled to a depth of approximately 1,600 feet without encountering bedrock. A depth to bedrock map is presented in Figure 2.

Three geological units have been described in the alluvial material in the area (Wickham and Corkhill, 1989). They are from land surface: the Upper Alluvial Unit (UAU), Middle Silt and Clay Unit (MSCU), and Lower Conglomerate Unit (LCU). These units form the major water





bearing formations in the basin. Lithologically, the three alluvial units may be described as follows (Wickham and Corkhill, 1989).

Upper Alluvial Unit (UAU): Mostly unconsolidated to slightly consolidated interbedded sands, gravels, lenses of silt, and clay with finer materials grading towards the center of basins.

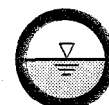
Middle Silt and Clay Unit (MSCU): Fine grained sediments, predominately silt, clay and sand, mudstone, and evaporites. Mostly weakly consolidated, but moderately to well-cemented siltstone/claystone occurs locally. Most commonly present in the center of basins, typically pinching out toward basin margins.

Lower Conglomerate Unit (LCU): Semi-consolidated to consolidated coarse grained sediments consisting of granite fragments, cobbles, boulders, sands and gravels.

Corkhill and Hill (1990) have organized the three alluvial units into two layers for the Pinal Active Management Area ground-water flow model (Pinal Model). The uppermost layer (Layer 1) corresponds with the Upper Alluvial Unit (UAU). The lower layer (Layer 2) corresponds with the Middle Silt and Clay Unit (MSCU) and the Lower Conglomerate Unit (LCU). The layer thicknesses are estimated below:

Section	Layer 1 Thickness (UAU) (feet)	Layer 2 Thickness (MSCU and LCU) (feet)
D(6-7)27	345	2,055
D(6-7)28	320	1,880
D(6-7)29	300	1,000
D(6-7)32	310	1,090
D(6-7)33	325	1,375
D(6-7)34	355	1,745
D(7-7)03	365	1,535
D(7-7)04	345	855
D(7-7)05	325	675
D(7-7)10	400	1,400

\*Source: Corkhill and Hill (1990)



## 3.2 HYDROGEOLOGY

Two distinct aquifers have been identified by ADWR in the study area. The upper aquifer is contained within the UAU, and the lower aquifer is contained within the MSCU and LCU.

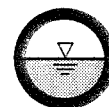
### 3.2.1 Aquifer Parameters

Aquifer tests were conducted at production wells P-4 and P-5 at the Robson Ranch Development. The locations of these wells are presented in Figure 1. The aquifer testing program for each well included a 24-hour step discharge test, a 24-hour constant rate discharge test, and a recovery test. The constant rate discharge test at P-4 was conducted on July 31, 1998. The well produced approximately 2,000 gpm for 24 hours with 283.4 feet of drawdown. The constant rate discharge test at P-5 was conducted on September 28, 1998. The well produced approximately 3,000 gpm for 24 hours with 161.1 feet of drawdown. P-4 was used as an observation well during the P-5 test. The average calculated transmissivity and storativity values for all of the tests and methods of analysis conducted are 38,300 gpd/ft and 0.00012 respectively. The storativity value is indicative of a confined aquifer. The aquifer test data are presented in Appendix B. The following chart presents the calculated transmissivity and storativity values for each test.

Aquifer Test	Method of Analysis	Well P-4	Well P-5	
		Transmissivity (gpd/ft)	Transmissivity (gpd/ft)	Storativity (Ø)
Constant Rate Test				
	Jacob	33,200	32,804	
	Jacob*		43,980	0.00012
	Theis	26,378	29,781	
	Theis*		43,083	0.00012
Recovery Test				
	Jacob	44,745	59,608	
Average		34,774	41,851	0.00012

\*observation well

Aquifer coefficients of transmissivity and specific yield were developed by ADWR for the ground-water flow model of the Pinal Active Management Area (Pinal Model), including the



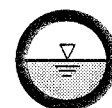
study area. The average hydraulic conductivity and storage coefficient values for the upper aquifer in the study area are 200 to 350 gallons per day per square foot (gpd/ft<sup>2</sup>) and 0.112 to 0.160, respectively (Corkhill and Hill, 1990). In developing representative aquifer parameters for this study, Layer 2 hydraulic conductivity parameters were multiplied by a factor of three as recommended by Corkhill and Plato (1992). The average hydraulic conductivity and specific yield values for the lower aquifer in the study area are 9 to 78 gpd/ft<sup>2</sup> and 0.08, respectively. The basic model data are presented in Appendix B. Based on a proposed perforated interval of 1,000 feet in the lower aquifer, the average aquifer transmissivity of the study area was estimated at 25,000 gpd/ft. The average specific yield for the lower aquifer in the study area is 0.080. A summary of the upper and lower aquifer layers aquifer coefficients is presented in Table 2.

The average aquifer transmissivity based on nearby aquifer testing of 38,300 gpd/ft is greater than the average value of 25,000 gpd/ft, which was calculated based on Pinal AMA Model data. Since aquifer testing results are preferred over model calibrated aquifer parameters, calculations in this report utilize an average aquifer transmissivity of 38,300 gpd/ft. Since the impact analysis presented in this report simulates the dewatering of the aquifer, it is more appropriately modeled as an unconfined aquifer. Therefore, calculations in this report were made utilizing the model-derived specific yield of 0.08 instead of the confined aquifer storativity determined based on aquifer testing.

### **3.2.2 Ground-water Surface**

The depth to ground water in the study area has been measured and reported by ADWR personnel over the past 50 years (ADWR, 2005a). The most recent and representative basin-wide water level measurements were collected in November 2003 through February 2004. A map of 2003-2004 static ground-water levels is presented in Figure 3. These measurements and subsequent ground-water surface elevations are presented in Appendix C.

Upper Aquifer - The upper aquifer is contained within the UAU, and is unconfined. The average depth to ground water of the upper aquifer in the study area ranges from approximately 113 ft bls to 137 feet bls, which translates to a ground-water surface elevation range from 1,325 to 1,350 feet above mean sea level (ft msl). Based on contours of the upper aquifer ground-water surface,



ground water generally flows south in the study area; however, there is an apparent ground-water divide in the study area, and ground-water flow in the northwest portion of the study area trends to the west-northwest (Figure 3).

Lower Aquifer - The lower aquifer can be confined or unconfined depending upon the presence of the MSCU. When the MSCU overlies the LCU, the lower aquifer is typically confined. If the MSCU is not present, the lower aquifer is typically unconfined (Bureau of Reclamation, 1977). The average depth to water of the lower aquifer in the study area ranges from approximately 110 ft bls to approximately 275 ft bls. Review of contours of the 2003-04 ground-water surface indicate that ground-water elevations range from 1,300 to approximately 1,175 ft msl (Figure 3). There is also an apparent ground-water divide beneath the Project in the Lower Aquifer with ground water primarily flowing to the southwest in the study area; however, a component in the northwest portion of the study area flows to the northwest.

### **3.2.3 Historical Ground-water Levels**

Historically, ground-water levels have been monitored by ADWR personnel in 6 wells located in the vicinity of the study area. The location of the 6 wells is presented in Figure 3 and hydrographs of water level data for those wells are presented in Figure 4.

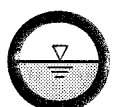
Review of data presented in the hydrographs indicates that pumping for agricultural irrigation caused ground-water levels to decline at a rate of 6.8 to 7.0 feet per year (ft/yr) between 1950 and approximately 1970. Ground-water levels subsequently began to recover between 1980 and 2001 with the retirement of agricultural land and use of Central Arizona Project water for irrigation, increasing at a rate of approximately 1.4 to 6.8 ft/yr (ADWR, 2005a). The ADWR GWSI ground-water level data (ADWR, 2005a) are presented in Appendix C.

### **3.2.4 Ground-water Quality**

Review of published ground-water quality data (Hammett, 1992) in the region indicates:

- a) Upper aquifer: specific conductance = 1,900 to 2,600  $\mu\text{S}/\text{cm}$  (TDS = 1,200 to 1,700 mg/L) and fluoride = 0.2 to 0.6 mg/L
- b) Lower aquifer: specific conductance = 450 to 820  $\mu\text{S}/\text{cm}$  (TDS = 300 to 530 mg/L) and fluoride = 0.7 to 6.0 mg/L

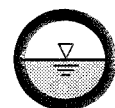
[Note: TDS was estimated by multiplying specific conductance by 0.65]



Review of the regional water quality data indicates that the upper alluvial aquifer has elevated total dissolved solids (TDS) concentrations and lower fluoride concentrations, and the lower aquifer has low TDS concentrations and fluoride concentrations potentially in excess of drinking water standards. A map of published ground-water quality data (Hammett, 1992) is presented in Figure 5.

Ground-water quality data for wells in the study area were obtained from the United States Geological Survey NWISWeb database. Review of data for the common water quality constituents of concern, arsenic, fluoride, nitrate, and TDS, indicates that concentrations are less than the Arizona Department of Environmental Quality (ADEQ) Maximum Contaminant Levels (MCL's) with one exception. The nitrite plus nitrate (as nitrogen) concentration reported for a sample collected in July 1984 from well D(06-07) 33CAA was 15 mg/L. However, this well is reportedly perforated in the shallowest portion of the Upper Aquifer from 60 to 240 ft bls (ADWR GWSI data), and is not representative of the Lower aquifer from which ground water proposed for the potable water system will be produced. The analytical results are presented in Appendix D.

A ground-water sample was collected from production well P-4 (ADWR No. 55-567966), one of the existing Picacho Water Company production wells located at Robson Ranch in the southwest quarter of the southwest quarter of the southwest quarter of Section 3 of Township 7 South, Range 7 East [D(7-7)3CCC], on July 12, 2005. Review of the analytical data indicates that concentrations are less than the Arizona Department of Environmental Quality (ADEQ) Maximum Contaminant Levels (MCL's) for those constituents tested. Well P-4 was drilled to a depth of 1,613 feet bls with perforations from 1,350 to 1,600 feet bls within the LCU. The analytical results are presented in Appendix D.



## **4.0 IMPACT OF PROPOSED DEMAND ON SUPPLY**

The impact on the regional aquifer ground-water development at the Project has been estimated based on the current demand estimates, calculated aquifer coefficients, and ground-water level trends. The aquifer impact has been estimated by use of THWELLS v 4.01 multi-Theis analysis software (van der Heijde, 1996). The calculated drawdown is added to the most current ground-water levels available (2003-04) and the estimated 100-year ground-water level decline in order to establish the projected 100-year depth to ground water at the Project.

### **4.1 AQUIFER IMPACT ANALYSIS**

The program THWELLS calculates the drawdown or buildup of piezometric head due to the combined effect of multiple discharge and recharge wells in a confined, leaky-confined, or unconfined aquifer. The calculations for total drawdown are based on the Theis (1935) equation for non-equilibrium flow in an isotropic, homogeneous aquifer (van der Heijde, 1996). Using the unconfined aquifer option, the calculated drawdown was corrected using the method described by Jacob (1946). The calculations are made at user-defined grid intersections.

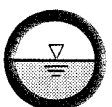
#### **4.1.1 Calculation Grid**

The grid encompasses an area approximately 5 miles by 6 miles encompassing the proposed Picacho Water Company well field and the Project. The nodal spacing is 400 feet in both the x and y directions. The grid values are in units of feet in the Universal Transverse Mercator (Zone 12, NAD 1927) coordinate system.

#### **4.1.2 Aquifer Parameters**

The transmissivity of 38,300 gpd/ft calculated based on aquifer testing of Robson Ranch wells P-4 and P-5 was used to calculate the aquifer impact at the site. The specific yield was estimated to be 0.08, based on Pinal AMA data for the Lower Aquifer.

The Jacob water table correction has been applied to better simulate unconfined aquifer conditions. The saturated thickness of 1,000 feet used in the analysis, was based on an estimated



static water level in the Lower Aquifer of less than 300 ft bls and a total well depth for future wells of 1,300 ft bls. No water table gradient or recharge has been assumed in the simulation.

A negative image well boundary was incorporated in the analysis to simulate the effect of bedrock outcrops associated with the Casa Grande Mountains. The location of this boundary is presented on Figure 6, and was selected based on the depth to bedrock in the area (Figure 2).

#### **4.1.3 Pumping Wells**

##### **4.1.3.1 Onsite Wells**

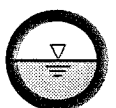
The locations of seven production wells which comprise the planned Picacho Water Company well field were simulated in the aquifer impact analysis. The estimated Project water demand of 309.4 ac-ft/yr or 191.8 gpm was added to projected demands for Robson Ranch (4,561 ac-ft/yr) and EJRW Ranch (5,622 ac-ft/yr), for a total of 10,492 ac-ft/yr or 6,505 gpm, which was divided evenly between the seven wells, for an assigned pumping rate of 1,499 ac-ft/yr, or 929 gpm per well. The locations of the onsite wells incorporated into the aquifer impact analysis are presented in Figure 6.

##### **4.1.3.2 Other Projects in the Study Area**

###### Arizona Water Company and Irrigation Well Pumping

The drawdown due to ground-water pumping in the study area by Arizona Water Company and existing irrigation wells was estimated by Clear Creek Associates (2001) in support of a Physical Availability Demonstration (PAD). However, review of ADWR's tracking sheets provided March 14, 2006 (Appendix E) indicates that approximately 60,000 acre-feet per year of the demand included in Arizona Water Company's Original PAD Model has not yet been accounted for in CAWS or AAWS applications.

Model files from the Arizona Water Company PAD were obtained and modified to only include demands for CAWS and AAWS applications listed on the ADWR tracking sheets. The demands for each Arizona Water Company Service Area in the original and revised models are presented below.



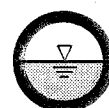
<b>Arizona Water Company Maximum Production Rates in acre-feet per year</b>		
<b>Service Area</b>	<b>Original Model</b>	<b>Revised Model</b>
Casa Grande and Arizona City	61,519	17,668
Coolidge	13,548	4,413
Tierra Grande	4,835	0
Stanfield	2,517	0
<b>Total</b>	<b>82,419</b>	<b>22,081</b>

The Arizona Water Company demands in the original model were increased over time reaching the maximum production rates in the year 2040. The revised model incorporates annual reported withdrawals for each Arizona Water Company service area for years 2000 through 2005. The revised model conservatively assumes that the maximum production rates are reached in the year 2006 and continue through 2106. Pumping for the 2006 through 2106 period was assigned to wells that are active based on the 2005 annual report, and the production rates were assigned proportionally to the reported 2005 production volumes. A summary of the production rates assigned to the AWC wells in the revised model is presented in Appendix E. Irrigation well pumping from the original model was left unchanged for the revised model.

Review of the model results for the revised AWC model indicates that the maximum drawdown for the 100-year period from 2006 through 2106 at the Picacho Water Company well field due to AWC ground-water production and irrigation well production is projected to be 300 feet. MODFLOW input and output files for the revised model are enclosed on a CD in Appendix E.

#### Vista del Monte AAWS

The 100-year aquifer impact of the Vista del Monte development was accounted for by reviewing a map of drawdown contours that was presented in the hydrologic study in support of the AAWS for the development (SGC, 2005). A copy of the map is presented in Appendix E. Review of the map indicates that the maximum drawdown at the Picacho Water Company well field due to pumping for the Vista del Monte development is 10 feet.





### City of Eloy DAWS

The projected aquifer impact due to proposed ground-water production for the City of Eloy as well as nearby irrigation well pumping was presented in a hydrologic study that was used to support an Application for a Modification of Designation of Assured Water Supply for the City of Eloy (Hydrologic Consultants, 2005). Review of the model output data indicates that the maximum projected drawdown after 100 years at the southern portion of the Robson Ranch Units 27 and 28 development is 210 feet. Supporting information from the hydrologic study is presented in Appendix E.

#### **4.1.4 Impact Simulation Output**

The drawdown grid after 100 years of pumping was calculated assuming that the onsite wells continuously pump at the assigned pumping rates. Contours of the calculated drawdown grid are displayed in Figure 6. The resulting maximum drawdown at onsite wells was 225 feet. The THWELLS output file for this impact analysis is included in Appendix F.

#### **4.2 100-YEAR GROUND-WATER LEVEL**

The depth to water after 100 years of pumping was calculated by adding the projected 100-year depth to water due to Arizona Water Company committed demands and existing agricultural pumping to the calculated aquifer impact of the Project, plus the projected impact of pumping associated with the Vista del Monte AAWS, and the City of Eloy DAWS, plus the water level decline trend, which was conservatively assumed to be 0 ft/yr. The 100-year depth to water calculation is presented below.



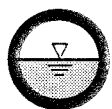
2003-04 Static Ground-water Level – Lower Aquifer	270 feet bls
Picacho Water Company aquifer impact	225 feet
Vista Del Monte	10 feet
City of Eloy and Irrigation Well Pumping*	210 feet
Arizona Water Company and Irrigation Well Pumping*	300 feet
100-Year Ground-water Decline @ 0.0 ft/yr	0 feet
<b>Picacho Water Company 100-Year Depth to Water</b>	<b>1,015 feet bls</b>

\* Irrigation well pumping within the City of Eloy model domain was accounted for in both the City of Eloy and the Arizona Water Company models, thus aquifer impacts from irrigation are overestimated. Irrigation well pumping simulated in the Arizona Water Company model was not removed for areas modeled to urbanize, and the so ground-water production is overestimated in these areas.

The maximum calculated depth to ground water at the Project, after 100 years of pumping, is 1,015 ft bls. This depth to ground water is less than the 1,100 feet below land surface depth to ground water limit established for the Pinal AMA by ADWR Rule R12-15-703.

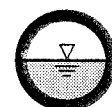
#### 4.3 CONCLUSION

Based on the impact analysis presented, sufficient ground water is available to meet the water demands of the proposed developments for at least 100 years.

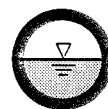


## 5.0 REFERENCES

- ADWR. 1999. Third Management Plan for the Pinal Active Management Area, 2000 – 2010. Arizona Department of Water Resources, December, 1999.
- ADWR. 2001. ADWR GIS Data. Arizona Department of Water Resources. May 2001.
- ADWR. 2004. On-line Imaged Well Records Database. Well driller reports. Arizona Department of Water Resources. Queried October 2004.
- ADWR. 2005a. Groundwater Site Inventory (GWSI) Database. Arizona Department of Water Resources, last updated June 2005.
- ADWR. 2005b. Wells 55 CD. Arizona Department of Water Resources. Last Updated September 2005.
- Bureau of Reclamation. 1977. Central Arizona Project - geology and ground-water resources report, Maricopa and Pinal Counties, Arizona. U.S. Department of the Interior. Volumes 1 and 2.
- Clear Creek Associates. 2001. Hydrology Study Report, Pinal AMA Casa Grande Groundwater Flow Model. August 31, 2001. Consultant's Report. Submitted to the Arizona Department of Water Resources in support of a Physical Availability Demonstration.
- Corkhill, E.F., and Hill, B.M. 1990. Pinal Active Management Area Regional Groundwater Flow Model, Phase II: Numerical Model, Calibration, Sensitivity, and Recommendations. Arizona Department of Water Resources. Modeling Report Number 2.
- E.F. Corkhill and P.R. Plato. 1992. Pinal Active Management Area Second Management Plan Simulation of Water Use Scenarios Utilizing the Pinal AMA Regional Groundwater Flow Model. Arizona Department of Water Resources, Hydrology Division, Modeling Report No. 4. 26 pp.
- Hammett, B.A. 1992. Maps Showing Groundwater Conditions in the Eloy and Maricopa-Stanfield Sub-Basins of the Pinal Active Management Area, Pinal, Pima, and Maricopa Counties, Arizona--1989. Arizona Department of Water Resources, Report Number 23.
- Hydrologic Consultants. 2005. Application for a Modification of a Designation of Assured Water Supply, Volume 2 of 2, Hydrogeologic Report. June 20, 2005. Consultant's Report. Submitted to the Arizona Department of Water Resources.
- Jacob, C.E. 1946. Drawdown Test to Determine Effective Radius of Artesian Well. In: Proceed. Of Am. Soc. Civil Eng., Vol. 79, No.5. ASCE, New York, New York.



- Kisser, K.G. and Haimson, J.S., 1982. Estimations of Aquifer Characteristics Using Drillers Logs. Unpublished technical paper by Arizona Department of Water Resources, 4pp.
- Oppenheimer, J.M. and J.S. Sumner. 1980. Depths-to-Bedrock Map - Laboratory of Geophysics. University of Arizona, Tucson, Arizona. Scale 1:250,000.
- Southwest Ground-water Consultants, Inc. 2005. Hydrogeologic Investigation, Vista Del Monte, Pinal County, Arizona. October 13, 2005. Consultant's Report. Submitted to the Arizona Department of Water Resources in support of an Application for an Analysis of Assured Water Supply.
- Theis, C.V. 1935. The relation between lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage. Am. Geophysical Union Trans. 16<sup>th</sup> Ann. Mtg. Pt2, pp 519 – 524.
- van der Heijde, 1996. THWELLS, Flow in Confined or Unconfined Aquifer with Multiple Wells. Released by International Ground-water Modeling Center, May 1996, v.4.01.
- Wickham, M.P. and E.F. Corkhill. 1989. Pinal Active Management Area Regional Groundwater Flow Model, Phase I: Hydrogeologic Framework, Water Budget, and Phase One Recommendations. Arizona Department of Water Resources. Modeling Report Number 1.



**Arizona Department of Environmental Quality**  
**Water Quality Compliance Assurance Unit**  
1110 W. Washington Street, 5415B-1  
Phoenix, AZ 85007

**Drinking Water Compliance Status Report**

**Public Water System Name:** Picacho Water Co.

**Public Water System ID #:** AZ0411135

**Overall Compliance Status:** ☒ No Major Deficiencies ☐ Major Deficiencies

**Monitoring and Reporting Status:** N/A

Comments: System is not yet regulated and no compliance monitoring requirements currently exist.

**Operation and Maintenance Status:** ☒ No Major Deficiencies ☐ Major Deficiencies

Comments: System has received pertinent approvals to construct and approvals of construction permits.

Major unresolved/ongoing operation and maintenance deficiencies:

- |   |   |
|---|---|
| <input type="checkbox"/> unable to maintain 20psi           | <input type="checkbox"/> inadequate storage           |
| <input type="checkbox"/> cross connection/backflow problems | <input type="checkbox"/> surface water treatment rule |
| <input type="checkbox"/> treatment deficiencies             | <input type="checkbox"/> approval of construction     |
| <input type="checkbox"/> certified operator                 | <input type="checkbox"/> other                        |

Date of last inspection / sanitary survey: N/A – First inspection is scheduled for June, 2006.

**Administrative Orders:**

Is an ADEQ administrative order in effect? ☐ Yes ☒ No

Comments:

**System information:**

Number of Points of Entry N/A Number of Sources N/A Population Served <25

Service Connections <15 Initial Monitoring Year TBD Initial MAP Year TBD

**Evaluation completed by:** John Calkins, Drinking Water Section Manager

**Phone:** (602) 771-4617

**Date:** 06/14/06

This compliance status report does not guarantee the water quality for this system in the future. This compliance status report does not reflect the status of any other water system owned by this utility company.